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PRODUCTION OF NEW MODELS BY CHINESE AUTOMOBILE INDUSTRY

A Chinese automobile industry delegation invited by the Japan- China Trade Promotion Association is expected to visit Japan. It is believed that the Chinese will gain a lot from the Japanese automobile industry, which has made a phenomenal progress in the recent years. Trucks built to withstand rough roads and yet economical to operate will be of great interest to the Chinese because of the rough roads and high cost of gasoline in China.

From Reconstruction to Adjustment

Since the first Chinese truck called "Chieh-fang" was produced by the Ch'ang-ch'un No.1 Automobile Plant in July 1956, various models have appeared. The production of vehicles increased from 1,654 in 1956 to 7,500 in 1957, 16,000 in 1958 and 19,400 in 1959 (according to Soviet report) and the number of types has increased to over 200.

However, China went into a period of adjustment in 1961 after the three successive years of natural calamities and the total withdrawal of Soviet economic aid and technicians. Many of the automobile plants were changed over to manufacture of parts and agricultural equipment. The number of types was reduced to nine and these were manufactured by the Nanking Automobile Plant, Peiping Automobile Plant, Shanghai Automobile Plant and the Chi-nan Automobile Plant.

The withdrawal of Soviet materials, parts and oils was a great blow to the Chinese automobile industry. The production of No.1 Automobile Plant, which was scheduled to produce 120,000 vehicles, was cut drastically. It wasn't until 1964 when the plant finally produced 2.7 times that of 1957 (7,500).

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Redevelopment of Automobile Industry

In 1965, the No. 1 Automobile Plant increased its production by 40.8 % over 1964. New model 3 ton, 5 ton and 7 ton "Chieh-fang" trucks and new luxury sedans called "Hung-ch'i" were designed and test produced. A mass production of heavy duty "Chieh-fang" trucks started. A rate of self-supply of metals needed for the manufacture of automobiles was increased to 98% in 1965 from 19% in 1956. Rubbers, glass, asbestos etc are now self-sufficient. Fuels and lubricating oils are also self-sufficient through progress made by petroleum industry. A new model called "Shanghai" [sedan] was produced during 1965 in Shanghai. Tientsin started producing light duty trucks, land cruisers and 9 passenger buses and Chungking began producing 25 ton dump trucks. In addition, Shanghai started producing light weight electric cars (all metal, 2 doors, 4 passenger, maximum speed of 33.4 km/hr and electrical supply for 80 km); Fu-chou Automobile Repair and Assembly Plant started producing 500kg capacity three wheelers for both passengers or cargoes; and the Kuang-chou Three Wheeler Management and Repair Shop started producing 300 kg capacity three wheelers (speed of 30-35 km/hr). China proved again the good results obtained through working out its own problems.

Self Sufficiency of Steel Surpassed 98%

Most of the rolled steel materials were imported when China first started building automobiles. This not only wasted foreign currencies but restricted the progress of automobile industry. Therefore, China made an effort to increase the rate of self-sufficiency first. During the second 5-year plan (1958-1962), industries engaged in metallurgy, chemicals and petroleum gave priority to materials and fuels needed by the automobile industry.

The iron and steel industries cooperated in providing superior quality steels for automobiles. A steel plate plant of the Anshan Steel Company responded to an urgent request of the No.1 Automobile Plant for wide steel rolled materials for roof tops. Shih-ching-shan Steel Plant in Peiping was asked to produce propeller shafts of high quality which were being imported but the plant was not equipped with a high precision roll to roll shaft pipes. In 1963, the No.1 Automobile Plant built a roller system for the Shih-ching-shan Steel Plant and within a month the Shih-ching-shan plant overcame various difficulties and started producing the precision shafts.

Development of New Alloys

A superior performance is demanded of automobile shafts, gears, cylinder blocks and many other parts. Some requires hardness but not brittle and some requires toughness and not soft and some requires hardness on the outside and toughness in the inside. The No.1 Automobile Plant were using a normal foreign method in producing parts from chrome steel and chrome cast iron, but this method consumed 5 kg of pure chrome per truck. Since chrome is relatively valuable, a substitute element became necessary.

In February 1959, no-nickel "Chieh-fang" trucks were test produced. A saving of 99.43% in nickel and 29.58% in chrome was realized. This resulted in a saving of 3kg of nickel per unit.

In 1958, the No.1 Automobile Plant and the Pen-ch'i Iron and Steel Plant worked jointly to find a substitute for chromes used in automobiles. They produced and tested nine different alloy steel materials and discovered parts made out of

some of these alloy steel materials were either equivalent or superior to the chrome alloy.

Several hundred "Chieh-fang" trucks using the new alloy materials proved superior after the three year test. Tests were conducted under varying conditions such as on hilly roads with many curves, high altitude, desert area and rainy and swampy area. These trucks were dismantled after 80,000 to 160,000 km but the gears, shafts and other parts were still normal and the wearability of cylinder blocks proved very good. A formal production of this type will begin this year. The discovery of new alloys is not only significant to automobile industry but to all machine industries.

Development of New Techniques at No.1 Automobile Plant

Development of new techniques, processing methods and facilities is being promoted constantly by the Chinese automobile industry. Since the first production in 1956, the No.1 Automobile Plant has progressed into building luxury type sedans in 1959 through a technical reform. The designing and testing of this new luxury automobile overcame over 600 technical problems. During the process, new techniques for production of high speed bearing metals, high pressure oil pump, hydraulic piston rod and noiseless gears were developed.

About 80% of the manufacturing methods used in the production of parts for "Chieh-fang" trucks have been reformed. Fourteen hundred pieces used in engine were improved. The engine output, horsepower, speed and fuel consumption were improved beyond the specifications set by foreign countries. They also reduced the cost of production through improvement in production method and economy in the use of raw

materials.

A mechanization rate at No.1 Automobile Plant was very high but bottlenecks still existed. In overcoming these bottlenecks, over 3,400 items were improved duting last year. The use of carbon disulfide gas protective welding [literal translation], electric pulse processing for forged tools, new heat resisting steel in place of nickel-chrome steel greatly improved the production. An use of arc welding of spokes required a man to weld 20- 30 pieces, whereas, the use of carbon disulfide gas protective welder increased the number to 80 pieces. Wheels department once went through 50 separate processes but the same processes are now being carried out in a one continues operation.

Improvement of Tools and Facilities

The heat treatment shop lacked a capability of galvanizing and the quality of galvanizing was very poor. The shop was given 170,000 yuan by the government to purchase a galvanizing machine; however, the workers renovated the existing facility for slightly over 10,000 yuan. The galvanizing efficiency was doubled and the quality was greatly improved.

Through a technical reform, operators of close to 100 machine tools almost double their productivity.

Dynamic equilibrium testing machine was not produced in China and the import of this machine meant a considerable expenditure of foreign currencies. Enginaers, technicians and workers decided to design and build their own and succeeded in producing one in four months. They also succeeded in producing their own rolling tools needed for processing the internal surfaces of cylinders of over 1 meter long.

Many of the imported facilities were improved. In the case of heating furnaces, internal structures were renovated to increase the productivity by 30- 80%. A box type heating furnace used in forging plant was an obsolete model of 1930 but the workers without any plans or blueprints designed their own small heating furnace which took up only $\frac{1}{4}$ of the floor space and the weight was reduced by 1/13. The production was doubled and the waste was reduced. Recently, a medium size heating furnace was successfully built. In addition, two medium size heating furnaces of different characteristics are being installed.

New Products Through Reform in Industrial Management and Production System

In the past, the Ch'ang-ch'un No. 1 Automobile Plant used a "western system" of industrial management but was changed to a system of placing responsibility on plant chief under the guidance of the communist party committee. Cadres, workers and technicians work together. They even go to test areas in desert, mountains and rough terrains to gather test data to improve their products. In the "western system", a production of a new model requires several years but the workers of this plant have made possible to mass produce a new model "Chieh-fang" heavy duty trucks in shorter time through rational planning and distribution of production facilities and tools.

The production of a new model "Hung-ch'i" was also speeded up. This is a 3 seats, 6 passengers luxury sedan using a hydraulic automatic transmission and new types of frame and V type engine. It is good looking, powerful, speedy, stable even around curves and has a well balanced design. It is equipped with sound proof glasses betwen each row of seats and has an electric temperature control. Specialists

claim that this new "Hung-ch'i" model has reached a top level internationally in outer design, internal furnishings and in performance. "Strictness", "carefulness" and "exactness" were the workers' motto. They placed responsibility on quality and over 5,000 pieces used in this model were carefully checked. Over 80 cooperating enterprises gave priority on parts used in this "Hung-ch'i". They supplied expeditiously over 800 parts of high quality to the No. 1 Automobile Plant. These factors contributed greatly in the production of this luxury model in such a short time.

Automobile Plant From Small Plants

Like the Ch'ang-ch'un No.1 Automobile Plant, other automobile plants were also repair shops at the beginning. The development of Chi-nan Automobile Plant, which produces 8 ton trucks, is a most typical example.

In 1949, this automobile repair shop had 200 employees and about 8 old belt type lathes. The present deputy chief and concurrently a chief engineer is a war veteran who repaired captured automobiles in a small shop. After he came to this plant, the government provided with an investment for an expansion of the plant. It started with the production of automobile parts and in 1958, small type jeeps and two types of small trucks have been test produced.

The great leap forward program of 1959 placed a heavy lead on motor transportations. A demand for trucks could not be met. Therefore, this plant requested the government to take over the test manufacture of 8 ton trucks. The First Ministry of Machine Industry approved the request. Designers used foreign blueprints as references and some were despatched to foreign countries to study the use of similar type trucks to be built and they came up with their own design.

With the exception of 6135 type diesel engines being supplied by other plants,

over 3,000 parts requiring complicated forging and precision are all manufactured by this plant. When the test manufacture of trucks started, only a 250 ton hydraulic press and a few multi-use machine tools were available. However, through technical reforms, facilities were renovated to mass produce vehicles. Since a large chassis frame press costs over 2,000,000 yuan and requires a larger building to house it, workers tried pressing out chassis frames using 250 ton press in several stages. However, the frames produced were distorted. The use of hydraulic jack press by another plant to press out chassis frames came to their minds and in nine months and a few thousand yuan they succeeded in producing a simple 1,050 ton special press with 6 hydraulic cylinders. In addition, the workers resolved over 100 specialized facilities. It took them four years to test produce their first vehicle but the cost to the government was only 1,000,000 yuan.

A test manufacture of 8 ton trucks was completed in 1963. Since Chi-nan is located on the shore of the Yellow River, these trucks were named "Huang Ho" [Yellow River]. A test proved the trucks to be superior in performance and durable. A mass production of this model started in 1964 and it is possible to change over to a production of dump trucks and buses using the same chassis if necessary.

The Nanking Automobile Plant, which produces 2½ ton "Yueh-chin" trucks, was also a repair shop employing only 30 people. It became a manufacturer of automobile engines since the liberation. A test manufacture of automobile started in 1958 and is now producing automobiles.

Special Emphasis on Specialized Cooperative Enterprises

Automobile industry includes related industries which produce parts, raw

materials and various equipment. Chinese automobile industry is placing a special effort in the development of cooperative enterprises and in specialization. The dependence on import of materials and parts from foreign countries was unavoidable when Ch'ang-ch'un Automobile Plant tried to become an all purpose plant with very little reliance on related industries.

The Nanking Automobile Plant started on a policy of manufacturing mainly the engines and have specialty plants supply the other parts necessary for the production of automobiles. They received cooperations from over 60 plants in 11 Provinces. The Shanghai Automobile Plant manufactures only the bodies but has 120 specialty plants for other parts, for example, engines come from Shanghai Internal Combustion Engine and Parts Plant and the chassis from the Automobile Chassis Plant.

These specialized plants concentrate on few parts which contributes toward the improvement in workers techniques and the quality of products. Each cooperating industry exchanges information and gives mutual technical assistance to produce higher quality goods. The production of three wheelers in Shanghai was greatly accelerated through use of this system.

This system is also more economical. A minimal expansion and increase of facilities at three small and medium size plants, which supply parts to Shanghai automobile industry, costs only 1/10 the amount needed to build a plant large enough to produce the same amount of parts. The expenditures of these three small and medium size plants amounted to only 15% of the profits offered to the government during the second 5 year plan while engaged in the manufacture of three wheelers.

The "Feng-huang" sedans, which have been manufactured by the Shanghai Automobile Plant for 8 years, have changed the name to "Shanghai". This plant is also

producing an open car called "Shanghai" SH 761.

The Shanghai Automobile and Parts Plant is highly automated and the efficiency of this plant's single automation line is regarded superior to similar types in other countries and the cost is only 1/7 of the imported price.

Gear Plant in Chungking Now Producing 25 ton Dump Trucks

The Kung-chiang Gear Plant in Chungking, which produced only parts for automobiles in the past, has succeeded in the manufacture of "Hung-yen" 25 ton dump trucks through cooperation from 60 plants of Shanghai. This model was given endurance tests at both northern and souther regions. The design, structure and the usage proved superior. It is faster, has better turning radius and more economical than the imported models of similar type.

Some of the plants, which supply parts for the Kung-chiang Gear Plant, not only provided parts but have contributed technical data as well.

132 Plants Cooperate in Producing 3 Models in Tientsin

Tientsin has succeeded in test manufacture of light duty trucks, land cruisers and 9 passenger buses through cooperation of 132 plants and industrial cooperative unions.

These plants formerly produced fragile parts but the quality, amount and the delivery of parts are now guaranteed after these plants were placed under a joint management of the city. A system of "joint designing, dispersed production and centralized assembly" is practiced. These plants have been allocated to specialize in manufacture of automobile parts, cast and forged parts, rubber products, plastic

and glass products.

Several hundred special facilities and several thousand processing facilities are required in the manufacture of automobiles. The Chinese overcame the problems and succeeded in designing and manufacturing 7,000 processing and 430 specialized facilities in nine months. The structure of most of these facilities is simple and the quality is very good. They are also efficient and not expensive.

All cars seen in Shanghai prior to 1958 were imported models. Some remarked that Shanghai was an international fair for foreign cars. Today, however, cars and three wheelers, "Chiao-t'ung" trucks, "Hai-ou" mini-cars, "Hsing-fu" motorcycles and "Shanghai" sedans are all produced in Shanghai. Although China has a long ways to go to meet the demand of the nation but has gained tremendous experiences during the last 10 years of struggles.